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Gaétan Prince
Téléphone : (514) 397-6725
gp@bcf.ca

BY FACSIMILE
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EUROPEAN PATENT OFFICE
P.B. 5818 Patentlaan 2
NL-2280 HV, Rijswijk
NETHERLANDS

Re : International application No. PCT/CA03/00980
Filed on 27 June 2003

Title : METHOD AND DEVICE FOR EFFICIENT IN-BAND DIM-AND-BURST SIGNALING AND HALF-RATE MAX OPERATION IN VARIABLE BIT-RATE WIDEBAND SPEECH CODING FOR CDMA WIRELESS SYSTEMS.

Applicants : VOICEAGE CORPORATION et al.

Our file : 08241-106

Sirs:

This is in response to the written opinion dated 2 June 2004.

The claims have been modified as follows:

Claim 1:

This claim has been amended to recite the following operations:

“ encoding a sound signal using the first coder to generate signal-coding parameters according to the first communication scheme;

receiving a request to transmit signal-coding parameters from said one station to the other station using said second communication scheme;

in response to said request, dropping a portion of the signal-coding parameters encoded according to the first communication scheme and transmitting to the decoder of the other station the remaining signal-

coding parameters, wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices; and

generating replacement signal-coding parameters to replace said portion of the signal-coding parameters and decoding, in the decoder of said other station, the signal-coding parameters."

Claims 2-8:

Subclaims 2-8, which depend upon claim 1, have been amended to reflect the modifications to claim 1.

Claim 19:

Changes similar to claim 1 have been introduced in claim 19.

Claims 20-26:

Subclaims 20-26, which depend upon claim 19, have been amended to reflect the modifications to said claim 19.

Respectfully submitted,

BROUILLETTE KOSIE PRINCE

Gaétan Prince

GP/Ir

WHAT IS CLAIMED IS:

1. A method for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a second decoder, wherein communication between the first and second stations is conducted by transmitting signal-coding parameters from the coder of one of the first and second stations to the decoder of the other of said first and second stations, said method comprising:

encoding a sound signal using the first coder to generate signal-coding parameters according to the first communication scheme;

receiving a request to transmit signal-coding parameters from said one station to the other station using said second communication scheme;

in response to said request, dropping a portion of the signal-coding parameters encoded according to the first communication scheme and transmitting to the decoder of the other station the remaining signal-coding parameters, wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices; and

generating replacement signal-coding parameters to replace said portion of the signal-coding parameters and decoding, in the decoder of said other station, the signal-coding parameters.

2. A method as defined in claim 1, wherein receiving a request comprises:

receiving a request to transmit the signal-coding parameters from said one station to the other station using a half-rate communication mode.

3. A method as defined in claim 1, wherein the first communication scheme is CDMA2000 VBR-WB and the second communication scheme is AMR-WB.

4. A method as defined in claim 1, wherein decoding the signal-coding parameters comprises:
operating the decoder of said other station in a full-rate mode.
- 5 5. A method as defined in claim 1, wherein generating replacement signal-coding parameters comprises:
randomly generating replacement signal-coding parameters to replace said portion of the signal-coding parameters.
- 10 6. A method as defined in claim 1, wherein:
generating replacement signal-coding parameters comprises randomly generating replacement fixed codebook indices.
- 15 7. A method as defined in claim 1, wherein:
dropping a portion of the signal-coding parameters comprises inserting an identification of a communication mode; and
transmitting the remaining signal-coding parameters comprises transmitting to the decoder of said other station the communication mode identification along with the remaining signal-coding parameters.
- 20 8. A method as defined in claim 1, comprising, in the coder of said one station:
performing a fixed codebook search to determine a fixed codebook excitation; and
using the determined fixed codebook excitation for updating an adaptive codebook content and filter memories for next frames.

- 30 9. A method for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a

second decoder, wherein communication between the first and second stations is conducted by transmitting signal-coding parameters related to a sound signal from the coder of one of the first and second stations to the decoder of the other of said first and second stations, the method comprising:

- 5 classifying the sound signal to determine whether the signal-coding parameters should be transmitted from the coder of said one station to the decoder of the other station using a first communication mode in which full bit rate is used for transmission of the signal-coding parameters;
- 10 receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a second communication mode designed to reduce bit rate during transmission of the signal-coding parameters;
- 15 when classification of the sound signal determines that the signal-coding parameters should be transmitted using the first communication mode, and
- 20 when the request to transmit the signal-coding parameters using the second communication mode is received, dropping a portion of the signal-coding parameters from the coder of said one station and transmitting to the decoder of the other station the remaining signal-coding parameters using the second communication mode, wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices.

10. A method as defined in claim 9, wherein receiving a request comprises:

- 25 receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a half-rate communication mode.

11. A method as defined in claim 9, wherein:

- 30 dropping a portion of the signal-coding parameters from the coder of said one station comprises inserting an identification of the second communication mode; and

transmitting the remaining signal-coding parameters comprises transmitting to the decoder of said other station the identification of the second communication mode along with the remaining signal-coding parameters.

5 12. A method as defined in claim 9, further comprising regenerating said portion of the signal-coding parameters and decoding, in the decoder of said other station, said signal-coding parameters into the sound signal.

10 13. A method as defined in claim 12, wherein regenerating said portion of the signal-coding parameters comprises randomly regenerating said portion of the signal-coding parameters.

14. A method for transmitting signal-coding parameters from a first station to a second station, comprising:

15 in one of said first and second stations, coding the sound signal in accordance with a full-rate communication mode;

16 receiving a request to transmit the signal-coding parameters from said one station to the other station of said first and second stations using a second communication mode designed to reduce bit rate during transmission of said signal-coding parameters;

17 in response to the request, converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode, wherein converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode comprises dropping a portion of the signal-coding parameters, and wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices; and

18 transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations.

15. A method as defined in claim 14, wherein receiving the request comprises:

receiving a request to transmit the signal-coding parameters from said one station to the other station using a half-rate communication mode.

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16. A method as defined in claim 14, wherein:

converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode comprises inserting an identification of the second communication mode; and

10 transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations comprises transmitting to the other station the identification of the second communication mode along with the non-dropped signal-coding parameters.

15 17. A method as defined in claim 14, further comprising regenerating said portion of the signal-coding parameters and, in the decoder of said other station, decoding said signal-coding parameters.

20 18. A method as defined in claim 17, wherein regenerating said portion of the signal-coding parameters comprises randomly regenerating said portion of the signal-coding parameters.

25 19. A system for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a second decoder, wherein communication between the first and second stations is conducted by transmitting signal-coding parameters from the coder of one of the first and second stations to the decoder of the other of said first and second stations, said system comprising:

30 means for encoding a sound signal using the first coder to generate signal-coding parameters according to the first communication scheme;

means for receiving a request to transmit signal-coding parameters from said one station to the other station using said second communication scheme;

means for dropping, in response to said request, a portion of the signal-coding parameters encoded according to the first communication scheme and

5 means for transmitting to the decoder of the other station the remaining signal-coding parameters, wherein the means for dropping a portion of the signal-coding parameters comprises means for dropping fixed codebook indices; and

means for generating replacement signal-coding parameters to replace said portion of the signal-coding parameters and means for decoding, in the
10 decoder of said other station, the signal-coding parameters.

20. A system as defined in claim 19, wherein the request receiving means comprises:

means for receiving a request to transmit the signal-coding parameters
15 from said one station to the other station using a half-rate communication mode.

21. A system as defined in claim 19, wherein the first communication scheme is CDMA2000 VBR-WB and the second communication scheme is AMR-WB.

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22. A system as defined in claim 19, comprising means for operating the decoder of said other station in a full-rate mode.

25
23. A system as defined in claim 19, wherein the means for generating replacement signal-coding parameters comprises:

means for randomly generating replacement signal-coding parameters.

24. A system as defined in claim 19, wherein:

the means for generating replacement signal-coding parameters
30 comprises means for randomly generating replacement fixed codebook indices.

25. A system as defined in claim 19, wherein:

the means for dropping a portion of the signal-coding parameters comprises means for inserting an identification of a communication mode; and

5 the means for transmitting the remaining signal-coding parameters comprises means for transmitting to the decoder of said other station the communication mode identification along with the remaining signal-coding parameters.

26. A system as defined in claim 19, comprising, in the coder of said one

10 station:

means for performing a fixed codebook search to determine a fixed codebook excitation; and

means for updating an adaptive codebook content and filter memories for next frames using the determined fixed codebook excitation.

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27. A system for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a second decoder, wherein communication between the first and second stations 20 is conducted by transmitting signal-coding parameters related to a sound signal from the coder of one of the first and second stations to the decoder of the other of said first and second stations, the system comprising:

means for classifying the sound signal to determine whether the signal-coding parameters should be transmitted from the coder of said one station to the decoder of the other station using a first communication mode in which full 25 bit rate is used for transmission of the signal-coding parameters;

means for receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a second communication mode designed to reduce bit rate during transmission of 30 the signal-coding parameters;

means for dropping, when classification of the sound signal determines that the signal-coding parameters should be transmitted using the first communication mode and when the request to transmit the signal-coding parameters using the second communication mode is received, a portion of the 5 signal-coding parameters from the coder of said one station and transmitting to the decoder of the other station the remaining signal-coding parameters using the second communication mode, wherein the means for dropping a portion of the signal-coding parameters comprises means for dropping fixed codebook indices.

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28. A system as defined in claim 33, wherein the request receiving means comprises:

means for receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a 15 half-rate communication mode.

29. A system as defined in claim 27, wherein:

the means for dropping a portion of the signal-coding parameters from the coder of said one station comprises means for inserting an identification of 20 the second communication mode; and

the means for transmitting the remaining signal-coding parameters comprises means for transmitting to the decoder of said other station the identification of the second communication mode along with the remaining signal-coding parameters.

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30. A system as defined in claim 27, further comprising means for regenerating said portion of the signal-coding parameters and the decoder of said other station for decoding said signal-coding parameters into the sound signal.

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31. A system as defined in claim 30, wherein the means for regenerating said portion of the signal-coding parameters comprises means for randomly regenerating said portion of the signal-coding parameters.

5 32. A system for transmitting signal-coding parameters from a first station to a second station, comprising:

 in one of said first and second stations, a coder for coding the sound signal in accordance with a full-rate communication mode;

10 means for receiving a request to transmit the signal-coding parameters from said one station to the other station of said first and second stations using a second communication mode designed to reduce bit rate during transmission of said signal-coding parameters;

15 means for converting, in response to the request, the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode, wherein the means for converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode comprises means for dropping a portion of the signal-coding parameters, and wherein the means for dropping a portion of the signal-coding parameters comprises means for 20 dropping fixed codebook indices; and

 means for transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations.

25 33. A system as defined in claim 32, wherein the request receiving means comprises:

 means for receiving a request to transmit the signal-coding parameters from said one station to the other station using a half-rate communication mode.

30 34. A system as defined in claim 32, wherein:

 the means for converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second

communication mode comprises means for inserting an identification of the second communication mode; and

the means for transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations
5 comprises means for transmitting to the other station the identification of the second communication mode along with the non-dropped signal-coding parameters.

35. A system as defined in claim 32, further comprising means for
10 regenerating said portion of the signal-coding parameters and the decoder of
said other station for decoding said signal-coding parameters.

36. A method as defined in claim 35, wherein the means for regenerating
said portion of the signal-coding parameters comprises means for randomly
15 regenerating said portion of the signal-coding parameters.

WHAT IS CLAIMED IS:

1. A method for interoperating a first station using a first communication
5 scheme and comprising a first coder and a first decoder with a second station
using a second communication scheme and comprising a second coder and a
second decoder, wherein communication between the first and second stations
is conducted by transmitting signal-coding parameters from the coder of one of
the first and second stations to the decoder of the other of said first and second
10 stations, said method comprising:

encoding a sound signal using the first coder to generate signal-coding
parameters according to the first communication scheme;

receiving a request to transmit signal-coding parameters from said one
station to the other station using said second communication scheme;

15 in response to said request, dropping a portion of the signal-coding
parameters encoded according to the first communication scheme and
transmitting to the decoder of the other station the remaining signal-coding
parameters, wherein dropping a portion of the signal-coding parameters
comprises dropping fixed codebook indices; and

20 generating replacement signal-coding parameters to replace said portion
of the signal-coding parameters and decoding, in the decoder of said other
station, the signal-coding parameters.

25 2. A method as defined in claim 1, wherein receiving a request
comprises:

receiving a request to transmit the signal-coding parameters from said
one station to the other station using a half-rate communication mode.

30 3. A method as defined in claim 1, wherein the first communication
scheme is CDMA2000 VBR-WB and the second communication scheme is
AMR-WB.

4. A method as defined in claim 1, wherein decoding the signal-coding parameters comprises:
 - 5 operating the decoder of said other station in a full-rate mode.
- 10 5. A method as defined in claim 1, wherein generating replacement signal-coding parameters comprises:
 - randomly generating replacement signal-coding parameters to replace said portion of the signal-coding parameters.
- 15 6. A method as defined in claim 1, wherein:
 - generating replacement signal-coding parameters comprises randomly generating replacement fixed codebook indices.
- 20 7. A method as defined in claim 1, wherein:
 - dropping a portion of the signal-coding parameters comprises inserting an identification of a communication mode; and
 - transmitting the remaining signal-coding parameters comprises transmitting to the decoder of said other station the communication mode identification along with the remaining signal-coding parameters.
- 25 8. A method as defined in claim 1, comprising, in the coder of said one station:
 - performing a fixed codebook search to determine a fixed codebook excitation; and
 - using the determined fixed codebook excitation for updating an adaptive codebook content and filter memories for next frames.
- 30 9. A method for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a

second decoder, wherein communication between the first and second stations is conducted by transmitting signal-coding parameters related to a sound signal from the coder of one of the first and second stations to the decoder of the other of said first and second stations, the method comprising:

5 classifying the sound signal to determine whether the signal-coding parameters should be transmitted from the coder of said one station to the decoder of the other station using a first communication mode in which full bit rate is used for transmission of the signal-coding parameters;

10 receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a second communication mode designed to reduce bit rate during transmission of the signal-coding parameters;

15 when classification of the sound signal determines that the signal-coding parameters should be transmitted using the first communication mode, and
20 when the request to transmit the signal-coding parameters using the second communication mode is received, dropping a portion of the signal-coding parameters from the coder of said one station and transmitting to the decoder of the other station the remaining signal-coding parameters using the second communication mode, wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices.

10. A method as defined in claim 9, wherein receiving a request comprises:

25 receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a half-rate communication mode.

11. A method as defined in claim 9, wherein:

30 dropping a portion of the signal-coding parameters from the coder of said one station comprises inserting an identification of the second communication mode; and

transmitting the remaining signal-coding parameters comprises transmitting to the decoder of said other station the identification of the second communication mode along with the remaining signal-coding parameters.

5 12. A method as defined in claim 9, further comprising regenerating said portion of the signal-coding parameters and decoding, in the decoder of said other station, said signal-coding parameters into the sound signal.

10 13. A method as defined in claim 12, wherein regenerating said portion of the signal-coding parameters comprises randomly regenerating said portion of the signal-coding parameters.

14. A method for transmitting signal-coding parameters from a first station to a second station, comprising:

15 in one of said first and second stations, coding the sound signal in accordance with a full-rate communication mode;

receiving a request to transmit the signal-coding parameters from said one station to the other station of said first and second stations using a second communication mode designed to reduce bit rate during transmission of said 20 signal-coding parameters;

in response to the request, converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode, wherein converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the 25 second communication mode comprises dropping a portion of the signal-coding parameters, and wherein dropping a portion of the signal-coding parameters comprises dropping fixed codebook indices; and

transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations.

15. A method as defined in claim 14, wherein receiving the request comprises:

receiving a request to transmit the signal-coding parameters from said one station to the other station using a half-rate communication mode.

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16. A method as defined in claim 14, wherein:

converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode comprises inserting an identification of the second communication mode; and

10 transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations comprises transmitting to the other station the identification of the second communication mode along with the non-dropped signal-coding parameters.

15 17. A method as defined in claim 14, further comprising regenerating said portion of the signal-coding parameters and, in the decoder of said other station, decoding said signal-coding parameters.

18. A method as defined in claim 17, wherein regenerating said portion of
20 the signal-coding parameters comprises randomly regenerating said portion of the signal-coding parameters.

19. A system for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station
25 using a second communication scheme and comprising a second coder and a second decoder, wherein communication between the first and second stations is conducted by transmitting signal-coding parameters from the coder of one of the first and second stations to the decoder of the other of said first and second stations, said system comprising:

30 means for encoding a sound signal using the first coder to generate signal-coding parameters according to the first communication scheme;

- means for receiving a request to transmit signal-coding parameters from said one station to the other station using said second communication scheme;
- means for dropping, in response to said request, a portion of the signal-coding parameters encoded according to the first communication scheme and
- 5 means for transmitting to the decoder of the other station the remaining signal-coding parameters, wherein the means for dropping a portion of the signal-coding parameters comprises means for dropping fixed codebook indices; and
- means for generating replacement signal-coding parameters to replace said portion of the signal-coding parameters and means for decoding, in the
- 10 decoder of said other station, the signal-coding parameters.

20. A system as defined in claim 19, wherein the request receiving means comprises:

- means for receiving a request to transmit the signal-coding parameters
- 15 from said one station to the other station using a half-rate communication mode.

21. A system as defined in claim 19, wherein the first communication scheme is CDMA2000 VBR-WB and the second communication scheme is AMR-WB.

- 20
22. A system as defined in claim 19, comprising means for operating the decoder of said other station in a full-rate mode.

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23. A system as defined in claim 19, wherein the means for generating replacement signal-coding parameters comprises:

means for randomly generating replacement signal-coding parameters.

24. A system as defined in claim 19, wherein:

- the means for generating replacement signal-coding parameters
- 30 comprises means for randomly generating replacement fixed codebook indices.

25. A system as defined in claim 19, wherein:

the means for dropping a portion of the signal-coding parameters comprises means for inserting an identification of a communication mode; and

5 the means for transmitting the remaining signal-coding parameters comprises means for transmitting to the decoder of said other station the communication mode identification along with the remaining signal-coding parameters.

26. A system as defined in claim 19, comprising, in the coder of said one

10 station:

means for performing a fixed codebook search to determine a fixed codebook excitation; and

means for updating an adaptive codebook content and filter memories for next frames using the determined fixed codebook excitation.

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27. A system for interoperating a first station using a first communication scheme and comprising a first coder and a first decoder with a second station using a second communication scheme and comprising a second coder and a second decoder, wherein communication between the first and second stations 20 is conducted by transmitting signal-coding parameters related to a sound signal from the coder of one of the first and second stations to the decoder of the other of said first and second stations, the system comprising:

25 means for classifying the sound signal to determine whether the signal-coding parameters should be transmitted from the coder of said one station to the decoder of the other station using a first communication mode in which full bit rate is used for transmission of the signal-coding parameters;

30 means for receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a second communication mode designed to reduce bit rate during transmission of the signal-coding parameters;

means for dropping, when classification of the sound signal determines that the signal-coding parameters should be transmitted using the first communication mode and when the request to transmit the signal-coding parameters using the second communication mode is received, a portion of the
5 signal-coding parameters from the coder of said one station and transmitting to the decoder of the other station the remaining signal-coding parameters using the second communication mode, wherein the means for dropping a portion of the signal-coding parameters comprises means for dropping fixed codebook indices.

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28. A system as defined in claim 33, wherein the request receiving means comprises:

means for receiving a request to transmit the signal-coding parameters from the coder of said one station to the decoder of the other station using a
15 half-rate communication mode.

29. A system as defined in claim 27, wherein:

the means for dropping a portion of the signal-coding parameters from the coder of said one station comprises means for inserting an identification of
20 the second communication mode; and

the means for transmitting the remaining signal-coding parameters comprises means for transmitting to the decoder of said other station the identification of the second communication mode along with the remaining signal-coding parameters.

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30. A system as defined in claim 27, further comprising means for regenerating said portion of the signal-coding parameters and the decoder of said other station for decoding said signal-coding parameters into the sound signal.

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31. A system as defined in claim 30, wherein the means for regenerating said portion of the signal-coding parameters comprises means for randomly regenerating said portion of the signal-coding parameters.

5 32. A system for transmitting signal-coding parameters from a first station to a second station, comprising:

 in one of said first and second stations, a coder for coding the sound signal in accordance with a full-rate communication mode;

10 means for receiving a request to transmit the signal-coding parameters from said one station to the other station of said first and second stations using a second communication mode designed to reduce bit rate during transmission of said signal-coding parameters;

15 means for converting, in response to the request, the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode, wherein the means for converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second communication mode comprises means for dropping a portion of the signal-coding parameters, and wherein the means for dropping a portion of the signal-coding parameters comprises means for dropping fixed codebook indices; and

20 means for transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations.

33. A system as defined in claim 32, wherein the request receiving
25 means comprises:

 means for receiving a request to transmit the signal-coding parameters from said one station to the other station using a half-rate communication mode.

34. A system as defined in claim 32, wherein:

30 the means for converting the signal-coding parameters coded in full-rate communication mode to signal-coding parameters coded in the second

communication mode comprises means for inserting an identification of the second communication mode; and

the means for transmitting the signal-coding parameters coded in the second communication mode to the other of said first and second stations
5 comprises means for transmitting to the other station the identification of the second communication mode along with the non-dropped signal-coding parameters.

35. A system as defined in claim 32, further comprising means for
10 regenerating said portion of the signal-coding parameters and the decoder of
said other station for decoding said signal-coding parameters.

36. A method as defined in claim 35, wherein the means for regenerating
said portion of the signal-coding parameters comprises means for randomly
15 regenerating said portion of the signal-coding parameters.